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"BRITISH RAINFALL, 1913."

The fifty-third annual volume of "British Rainfall" is already in the hands of subscribers, having been published at an earlier date than in any year since 1902. Despite efforts to restrict the expansion of the volume so as to reduce, within reasonable limits, the apparently inevitable annual deficit, it continues to grow in size, containing 476 pages against 468 last year.

The book, which is compiled under the direction of Dr. Mill by Mr. Salter and Mr. Mossman, opens with the Report of the Director to the Trustees of the British Rainfall Organization. Reference is made to the great loss sustained by the Organization in the death of Sir John Murray, who represented Scotland on the Board of Trustees, and who for many years took a great interest in the whole work carried on at Camden Square. The continued expansion of the Organization in all its branches has led to an application to the "Development Fund" for assistance in order that the large volume of records may be adequately discussed with special reference to agriculture, and in other utilitarian directions which the limited income available at present renders impossible. Dr. Mill points out that it is the continued and unchecked expansion of the work in all its aspects that has led to this request.

The routine work carried on at Camden Square has continued on the same lines as formerly. The total number of records appearing in *British Rainfall*, 1913, shows a net increase of 98 over the previous year, amounting to 5370. Complete daily records were received from 3370 stations, and less complete daily returns from 364 others.

Since last October, owing to a temporary breakdown in the health of the Director, his duties were carried on by Mr. Salter and Mr. R. C. Mossman. Despite the difficulties occasioned by the Director's unavoidable absence, the work has proceeded without a hitch, a result largely due to Mr. Salter's thorough knowledge of the workings of the British Rainfall Organization and the efficient and whole-hearted manner in which he was supported by the other members of the staff. In recognition of these services to the Organization, the Trustees have appointed Mr. Carle Salter Assistant-Director, while Mr. H. E. Carter has been appointed Chief Computer, and Mr. D. S. Salter, Cartographer.

The general treatment of the data continues on the same lines as formerly. There are three special articles, the first being an appreciation of the late Sir John Murray, by Dr. Mill, and the others by Mr. Mossman, one on the July and August drought of 1913, the other on heavy rains in short periods from 1868 to 1913. As in the last few years, the entire responsibility for the production of Part III. rested with Mr. Salter, who also compiled a considerable portion of Parts I. and II., in which he was assisted by Mr. Mossman.

The volume is, as usual, fully illustrated by maps. Two of these are printed in colour, one representing the variation of the local rainfall in the British Isles during 1913 from the average, the other depicting the heavy fall of rain near Doncaster on September 17th, 1913.

THE RENEWAL OF ANTARCTIC EXPLORATION AND RESEARCH.

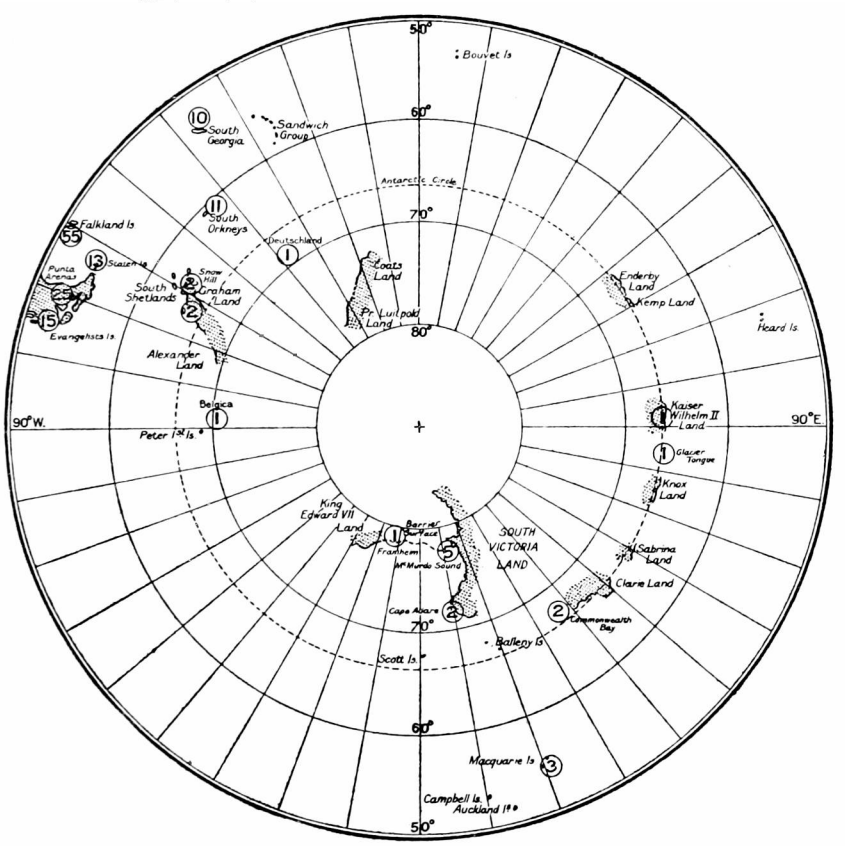
By R. C. Mossman, F.R.S.E.

Although from a popular standpoint the attainment of the South Pole marked the culminating point of recent Antarctic research, it is only now that specialists are beginning to perceive the many problems of both practical and theoretical interest that the Antarctic campaign, prosecuted so vigorously during the last 15 years, has opened out. This increase of interest is well shown by the circumstance that the plans of four well equipped Expeditions, differing markedly from each other in their aims and objects, have been before the public for some time. Of these the most important, from both a geographical and a popular point of view, is that of Sir Ernest Shackleton's Imperial Trans-Antarctic Expedition which so recently left our shores. This Expedition has been fitted out not only with the primary object of re-establishing British prestige in Polar fields, but of making observations covering all branches of Physical Science at two base stations some 1600 miles apart. During a portion of this time the main body of explorers under Sir Ernest himself, will, as far as circumstances permit, be conducting similar observations over the Antarctic Sahara, on their great march from the Weddell to the Ross Sea, and further subsidiary sledge expeditions from both bases will be likewise engaged making important geological and other investigations. Of the three other expeditions which will shortly set out the Austrian will, in the main, be devoted largely to research in the Weddell Sea area on somewhat the same lines as the Shackleton Expedition, minus the trans-antarctic journey. It is obvious that if this Expedition has the good fortune to set up winter quarters in the Weddell Sea that its results in every department of science will enhance and be enhanced by the neighbouring British Expedition. Mr. Stackhouses' Expedition, which is expected to leave these shores about the end of the year, will be devoted mainly

to oceanographical and biological studies over the great southern oceans up to the highest latitudes. Exceedingly valuable results are to be expected from hydrographical and biological research over such an extended period as is contemplated by the leader of this Expedition.

The Anglo-Swedish Antarctic Expedition, under Dr. Otto Nordenskjöld, is expected to leave Europe in August next year, and to carry on general scientific investigations for at least four or

METEOROLOGICAL RECORDS IN SOUTH POLAR REGIONS.



five years on the coasts of the South Shetlands and Graham Land, from a fixed station to be established on the east coast of the latter country. It is hoped that among other debated questions which this Expedition will solve is that of the connection between West Antarctica, Graham Land, and its environs, on the one hand, and that of the " true Antarctic Continent " on the other. It will thus be seen that the next few years should witness a great increase in our general knowledge of Antarctica, and the present seems an

opportune moment to draw attention to the present position of meteorology in high southern latitudes. To illustrate some of the points we shall briefly comment on the map of the South Polar regions south of lat. 50° S., which has been prepared. The position of stations where meteorological (and in most cases magnetical and physical) observations have been made is indicated by a ring, and a figure inside the ring shows the number of years over which the observations extend. Dealing first with the area to the south of 60° S., it will be seen that we possess data covering a combined period of 29 years from 11 stations, one of which, viz., the Argentine Station at the S. Orkneys has been carried on without interruption since March, 1903, thus furnishing nearly one-third of the whole observations.

The only other locality with more than two years observations is in McMurdo Sound, where data covering five years are available. Of this material Captain Scott's two expeditions supplied four years' results, and Sir Ernest Shackleton's one year's. Subsidiary data in this region are afforded by two years' observations from C. Adare, and a year's observations on the Ross Ice Barrier to the east where Amundsen set up his winter station.

On the Atlantic side the long S. Orkney record is supplemented by the observations taken on Filchner's Expedition, as well as by observations, nearly all simultaneous, taken by Nordenskjöld, Charcot, and at S. Georgia, the Falkland Islands, and several stations at the extremity of the S. American continent, only a few of which are indicated on the map owing to its being on too small a scale to mark the position of the stations belonging to the Argentine and Chilian Weather Services. The data refer to results accruing from fixed observatories, except in two instances, where the Antarctic Research ship was frozen up in the ice. This happened in the case of the "Belgica" in 1898-99, and again in 1912 when the "Deutschland" was beset in the Weddell Sea, and drifted about in the ice between the months of March and November. The mean position of the ship has been indicated in these specific cases. It will be seen that the only areas which afford material sufficient to give even an approximation to a true knowledge of the meteorology of the circum-polar regions are situated to the south and south-east of the S. American continent on the one hand, and almost due south of Australia on the other, the longitudes embraced by the records being from 90° to 30° W., and from 168° W. to 143° E.

Data are also available for a small area situated on the Antarctic circle to the east and west of the 90th meridian of E. longitude, where Sir D. Mawson had his western base, near where the "Gauss" Expedition wintered in 1902. To put it briefly, only over one-third of the S. Polar area south of 60° S., and extending in one instance only as far as 78° 30° S., have we even a general knowledge of the

climatic features throughout the year. Of course there is a considerable mass of data relating to summer conditions, derived from cruises made in other areas during this season, and there are similar data available from various sledge journeys made from the main base of several expeditions, but this information is necessarily somewhat scanty and only enables us to obtain glimpses of the climatic conditions of the regions involved, over a very limited portion of the year.

It will thus be seen from this brief reference that the material available for the investigation of Antarctic climate is all too scanty, and that many years must necessarily elapse before sufficient data are accumulated to enable us to give a picture of the normal conditions. For this reason it is a matter for congratulation that in the near future we may look forward to a substantial addition to our knowledge of the meteorology of the South Polar regions.

WEATHER IN THE SEVENTEENTH CENTURY (LAST QUARTER).

By Walter Sedgwick.

I.—Spring and Summer to end of July.

In Volume 46 of this Magazine the weather in the Seventeenth Century was considered in a series of articles based on the observations recorded in the diaries of two contemporaries, John Evelyn, F.R.S., and Samuel Pepys, F.R.S. Pepys diary deals with the years 1660 to1669. Evelyn's diary extends over the whole period of his life, 1620 to 1706, but his notes on weather are most frequent during the last 25 years, *i.e.*, 1681 to 1706.

It is now proposed to consider the weather during the last quarter of the same century from information given by a contemporary diarist living in another part of England. This diarist was the Rev. Wm. Samson, Rector of Clayworth, Notts., who from 1676 until his death in 1701 kept a parish record called " The Rector's Book," in which besides noting local events he entered many observations on the weather and the condition of crops. His entries were transcribed and edited in 1910, and the extracts given in this series of articles are taken from that edition.

Clayworth is a small village in the north of Nottinghamshire, about six miles west of Gainsboro, and eleven miles north-east of Worksop. The village lies near the River Idle, a tributary of the Trent, at a height of only about 50 ft. above sea level. The surrounding country is generally low lying, but on the north, east and south-east the ground rises gradually to a height of about 150 ft. above sea level, and at one point to a maximum of 255 ft. The

village is situated in a very dry area with an annual rainfall of 25 inches or less.

It is proposed to divide the weather observations in the Rector's Book into three parts viz.—(I.)—Spring and Summer to the end of July. (II.)—Harvest and Autumn. (III.)—Winter. This article deals with the first named period, *i.e.*, March 25th, O.S., the beginning of the year under the Julian Calendar, to July 21st, O.S. (April 4th to July 31st N.S.). When comparing the weather described in the Rector's Book with the weather of to-day allowance must be made for the change in the calendar fron the Old Style to the New Style. This change was fully explained in the former series of articles (See Vol. 46, p. 63), where it was shown that the present or Gregorian calendar is in advance of the old or Julian calendar by ten days, as regards the Seventeenth Century, and eleven days as regards the Eighteenth Century up to 1752, when the New Style was adopted in England. The difference is roughly a third of a month, and in considering the extracts given at the end of this article this difference must be borne in mind.

It cannot be claimed that the observations made by Mr. Samson upon the weather of his time give any certain and definite idea of the character of the weather during the quarter of a century which his record covers, nevertheless his observations are of some interest, in that they point to the weather conditions then being not unlike those of the present time. In fact so far as Mr. Samson's observations go, it would appear that there is great similarity between the weather at the beginning of the 20th Century in England and that at the end of the 17th Century. It is obvious that in Mr. Samson's lifetime the springs and summers were uniformly warm and genial, but showed considerable variations in different years. In springtime there were, it is true, many warm spells, but there were also many spells of severe weather, cold winds and snow, even as late as the middle of May. The picturesque expression " snow up to the shoe tops " occurs in more than one April. There were many Mays when the " Ice Saints " nipped the fruit trees, and in 1693 the fruit was apparently seriously damaged by cold winds as late as June.

The rather frequent occurrence of floods recorded by Mr. Samson even in spring and summer is perhaps at first sight surprising, having regard to the low average rainfall of this area at the present time. There is, however, a natural liability to floods in the neighbourhood of Clayworth, owing to its general elevation being very little above sea level, and as this liability depends not only on the rainfall but on the care taken in keeping cuts and outfalls cleaned, the more frequent occurrence of floods in the seventeenth century than now would not necessarily imply a change in the average annual rainfall.

There are some indications in the Rector's Book of short term variations in the climate. For instance, there are three severe

droughts recorded during the six years 1681 to 1686, and another very dry summer in 1690, but there are no long droughts referred to in the remaining eleven years. As far as it is possible to judge, it seems that the springs and summers in the decade 1691 to 1700 were on the whole, wetter than those in the previous decade 1681 to 1690. Then again all the records of severe spring weather occur in the latter portion of the period covered by this book. Up to the year 1687 there is no note made of cold weather in April of May, whereas after 1686 entries of cold spring weather are made almost every year. Snow is recorded in April (N.S.) in 1688, (13th) 1689, (6th) 1692, and 1695 (9th), and in the year 1698 he records as late as the 13th May that " snow fell and lay all day." The years when the advent of spring was latest were 1695 and 1698, but the worst summer in this period was probably that of 1692, which is also noted by Evelyn as exceedingly bad throughout.

When the weather observations in the Rector's Book are compared with those in Evelyn's diary, there is found to be a remarkable similarity considering that one set of observations relate to the north of Nottinghamshire and the other to the neighbourhood of London. This will be seen in the following table :—

Year.	*Rector's Book.*	*Evelyn's Diary.*
1681.	Severe drought	Severe drought and cold spring
1682.	Very wet from mid-April to mid-May	Mid-April a very wet season
1683.	March dry, end of April wet	March hot and dry, April wet
1684.	Very severe drought	Late spring,then hot,very severe drought
1685.	Plague of caterpillars	Very severe drought, plague of caterpillars
1689.	April first week cold and snow, middle of May severe frosts	One of the most seasonable Springs free from the usual sharp east winds
1692.	Very wet	Very cold Spring, very wet summer
1693.	April wet	April wet
1695.	Cold and late Spring	Cold and late Spring
1696.	May to July wet	Summer wet and cold
1698.	May cold and snowy	May cold and snowy
1699.	June weeks alternating wet and dry	June excessively hot
1700.	Variable	Spring genial, June fine
1701.	Backward Spring	Early Spring dry

The only occasion when there is a very noticeable divergence between the notes of the two Observers is in the spring of 1689. The divergence may be due to a real difference in the weather of that spring between London and Nottingham, or possibly to the fact that there was a fine period between the two spells of cold recorded by

the Rector. Evelyn's observation is dated 21st April (O.S.), the Rector's 27th March and middle of May.

NOTE.—In the following extracts the dates in the margin are all New Style and the dates given in the extracts have been corrected to New Style, except in cases where the extracts are under the heading "Seasons." In these cases it has been found more convenient not to depart from the language of the diary, but where possible the corresponding dates in New Style are given in brackets.

Dates, New Style.

1676. June 21 Hay time began.

1677. May 11 A very sore stormy rainy day (Mayday, O.S.)
Seasons.—It was very wet in May and June.

1678. July 11 Hay-sil began (*i.e.* hay harvest).

1679. July 3 Hay time began.

1680. June 1 Waters overflow the Carre and Common

1681. *Seasons.*—It was a very dry and droughty year from the beginning of April to the 20th June (30th), having not rained, except on the 7th May (17th), between these two times. . . . . It was also a very waspy year.

1682. *Seasons.*—From the middle of April to the middle of May it was very wet, the meadows were generally drowned. . . . . and great fears of scarcity of fodder. But the weather taking up there was more than ordinary plenty.

1683. *Seasons.*—At end of March was great drought by means whereof abundance of green lice covered the buds of apple trees. . . . . The latter end of April was dropping, about the midst of May wet weather.

1684. *Seasons.*—In the beginning of April green mites observed on apple tree buds . . . . In the declension of June clocks or locusts great store upon trees. Very droughty all the spring and up to the 28th July (August 7th).

1685. *Seasons.*—It was a sore year of caterpillars which, with ill blasts, destroyed all our hopes of apples.

1686. *Seasons.*—In May a great flood.

1687. *Seasons.*—The Spring was fair and forward, but then in April very sharp and severe, so that young pigeons were everywhere found to die, one or both in their nests, the old ones not finding food to feed them. About Mayday (11th), droughty and dry, and about the 8th (18th) day came steeping rains.

1688. April 13 Snow up to the shoetops.
May 9 Very much rain.
May 13 Very much rain.

1689. *Seasons.*—The year began (*i.e.* April 4th N.S.) with cold and wet; the 27th March (April 6th), was snow to the shoetops. About the midst of May were three or four frosty nights which blasted most fruits and cut chops in apples to the very core.

1690.		*Seasons.*—At the latter end of April rains fell after a drought of two months. On the 30th May (9th June), all was dry at Parson Hern. The beginning of July was very dry and droughty.
1691.		*Seasons.*—The Spring was forward, rains in June which made a bad haytime.
1692.		*Seasons.*—The end of March and beginning of April was stormy, wind, rain, and snow; so was also the latter end of April from the 24th day (May 4th). In May the rains hindered our processioning and winds in the latter end of the month were violent and blasting and cut off a great deal of young fruit. From Midsummer to the end of June rains put out the waters . . . . the ways not being passable. In July rains again from 12th to 17th (22nd to 27th).
1693.		*Seasons.*—April showery and at later end very wet. June. A blast upon the setting of fruit. July 16th (26th) rained sorely.
1694.	April	9th, a soaking rain after a long drought; 13th, windy; 18th, showery; 20th, windy; 30th, very hot
	May	11th, rains after three weeks drought; 21st, dewy; 29th, turned to fair weather.
	June	28th, thunder and lightening in the evening.
	July	16th, very hot weather; 19th to 21st, very windy; 29th, rains after long drought.
1695.	April	9th, snow to the shoetops; 15th, wind N.E. from the beginning of the month; 24th, turns to rain.
	May	1st, wet weather; 17th, a sere wind from the north.
	June	1st, a backward Spring; not hitherto one hot day; 30th, rain after a long drought.
	July	28th, thunder with lightnings and rain.
1696.	April	6th, sharp east winds continue.
	May	9th, dropping; 12th, high winds; 17th, rain from noon to night; 27th, rain all day.
	June	12th, storm of rain; 15th, a sore rainy day. We went not this year in procession (in Rogation week) . . . . . the way was so foul and weather ill.
	July	4th, very rainy these two or three days.
1697.		*Seasons.*—Fruit much blasted by May winds.
1698.		*Seasons.*—What remained of March (*i.e.* April 4th to 10th N.S.), calm and warm. April windy as if it had been March.
	May	1st, snow all afternoon; 13th, snow fell and lay all day.
	June	10th, rain prevented our processioning. *Seasons.*—June. The Spring backward by sharp winds.
	July	21st, 22nd, and 25th, rayns.
1699.		*Seasons.*—March. From the 25th to the end of the month (April 4th to 10th), dropping weather. April 1st to 14th (11th to 24th), wind N.E. By 23rd (May 3rd), ground dry and so continues to the month's end (May 10th). On the 4th (14th) May, fell rain, but by the 19th (29th), a very

		dry time which caused green clocks (resembling wevels) to abound and harm the fruit. June, the weeks alternating, wet and dry.
1700.	April	12th, cold winds,; 15th, stormy; 27th , showery.
	May	8th, thunder and lightning; 22nd, much rain.
	June	9th, much thunder with lightning and rain; 24th, rain after long drought.
	July	8th, rainy; 16th, a very great shower; 20th, good hay weather.
1701.	April	6th, a mild day; 16th, sharp wind; 20th, fine and calm; 25th, sharp wind.
	May	9th, a very backward Spring.
	May	25th, some sprinklings after a fortnight's drought; 28th, rains follow.
	June	20th, showery; 24th, thundering and rain.
	July	3rd, thunder and rain; 8th, hot weather; 20th, great rain in the afternoon.

THE WEATHER OF JULY.

THE month opened with very hot weather, the shade thermometer on the 1st rising to 94° at Camden Square, 92° at Greenwich, and 90° at Wisley (Surrey) In the north and west of Scotland and in some parts of Ireland, on the other hand, cool weather prevailed, with maxima in many cases under 65°. The high temperatures were associated with falling pressure over the United Kingdom, and regions surrounding, with heavy thunderstorms over a large part of England. Heavy rain fell at many places, about 2 inches being recorded at York, Harrogate, Bradford, and Claverley on the 1st, and a similar quantity at Shrewsbury on the 2nd, when temperature fell considerably. On the 4th when a large depression was approaching from the Atlantic, a southerly gale was experienced at Malin Head, but calm weather, with rather low temperatures occurred in some parts of Scotland, the shade thermometer on this day falling as low as 30° at West Linton, the next lowest in Scotland being readings of 38° recorded at many scattered localities all over the country, and at Markree Castle in the west of Ireland. In England the lowest readings were 36° at Newton Rigg and 37° at Marlborough and Llangammarch Wells. From about the 5th to the 8th a depression of no great depth lay over the Kingdom, causing rainy conditions in most districts, but the falls were in no instances considerable. On the 8th thunderstorms occurred in a few of the Midland Counties and in the north of England. On the 11th temperature fell to 37° at West Linton when Scotland was within the limits of an anti-cyclonic system, the centre of which lay between the Faeroe and the Norwegian coasts. After the 11th until quite the close of the month, conditions over our Islands were determined

THAMES VALLEY RAINFALL. ——— JULY, 1914.

Symons's Meteorological Magazine.

Watershed of River Thames above Teddington, and River Lee above Feildes Weir.

Rainfall Stations reporting.
Isohyetals.

by a series of shallow depressions which spread in from the Atlantic. Mist or fog was very prevalent, especially on coastal regions; temerature was in general above the average, this being largely due to the high night values. Thunderstorms were comparatively frequent over a wide area, and on some occasions were associated with heavy falls of rain. On the 12th 1·54 in. of rain fell in an hour at Whitstable, and on the 19th during the passage of a small cyclonic system outside our extreme south-west coasts, 2·75 in. fell at Ottery St. Mary, 3·03 in. at Milverton, and 3·07 in. at Wellington in Somerset.

Thunderstorms occurred in the south and east of England on the 22nd, when 1·48 in. fell at Broadstairs, and 2·03 in. at Margate 1·76 in. in an hour. Towards the close of the month temperature fell considerably, the thermometer on the 25th failing to reach 60° at many stations in the Midland Counties; this cool spell continued until quite the close of the month.

The general rainfall of the month, expressed as a percentage of the average, was :—England and Wales, 120; Scotland 86; Ireland 97; British Isles 104.

INTERNATIONAL BALLOON ASCENTS.

By W. H. Dines, F.R.S.

September 11th, 1911.

Starting Point.	Country.	A (Hc.) miles.	B (T_c.) ° F.	C miles.	D ° F.	E miles	F
Crinan	Scotland ..	6·9	—72	8·8	—70	95	N.E.
Manchester	England ..	6·9	—73	10·7	—64	75	N.E. by E.
Pyrton Hill, 7 a.m.	,, ..	7·5	—69	11·4	—56	44	N.E.
,, 7 p.m.	,, ..	7·5	—69	9·0	—65	91	N.E. by E.
Brussels	Belgium ..	8·4	—79	10·3	—74	13	E.N.E.
Paris.....	France	7·6	—75	10·2	—71	10	N.E. by E.
Vienna.....	Austria ..	7·3	—84	7·5	—77	61	S.
Pavia	Italy	8·2	—86	10·2	—77	22	S. by W.
Pavlovsk.....	Russia	5·6	—55	8·7	—44	44	S.
September 12th, 1911.							
Crinan	Scotland ..	7·1	—66	9·5	—63	187	N.E.
Manchester.....	England ..	7·5	—62	14·5	—49	88	N.E.
PyrtonHill	,, ..	7·5	—68	11·3	—54	50	N.E.
,, 7 p.m.	,, ..	7·2	—67	11·8	—68	71	N.E. by N.
Petersfield	,, ..	7·5	—74	11·9	—58	62	N.E. by N.
,, 7 p.m.	,, ..	6·9	—70	11·2	—72	68	N.E. by N.
Brussels	Belgium ..	8·4	—85	13·1	—63	16	E.
Hamburg.....	Germany..	7·9	—85	8·3	—83	26	E.S.E.
Paris.....	France ...	7·8	—86	9·7	—68	16	N.E.
Strassburg	Germany ..	?		7·9	—81	9	E.N.E.
Vienna.....	Austria	7·6	—75	10·5	—65	27	S. by E.
Pavia	Italy	7·4	—61	8·8	—56	18	E. by N.
Pavlovsk.....	Russia	6·4	—59	8·2	—49	111	S. by E.
Nishni Olchedaeff	,, ..	6·7	—61	10·8	—54	61	S.S.E.

September 13th, 1911.

Starting Point.	Country.	A (H_c) miles	B (T_c) ° F.	C miles.	D ° F.	E miles.	F
Crinan	Scotland ..	6·3	—54	9·4	—49	109	E.N.E.
„ 6.40 p.m,..	„	5·9	—56	10·6	—56	44	E.
Manchester.....	England ..	6·3	—50	14·3	—45	53	N.E. by E.
Pyrton Hill, 6.50 p.m.	„	6·9	—60	8·8	—60	73	E.N.E.
Brussels	Belgium ..	8·4	—74	?	?	58	N.E.
Hamburg	Germany..	7·6	—76	8·4	—75	45	N.E. by E.
Lindenberg.....	„	7·9	—79	9·3	—65	29	E.
Paris.....	France			7·2	—76	78	E.N.E.
Strassburg.....	Germany ..	7·9	—79	11·1	—72	60	E.N.E.
Munich	„ ..	7·8	—79	10·3	—62	25	E.
Pavia	Italy	8·0	—85	13·3	—65	13	S.E.
Pavlovsk.....	Russia	6·9	—66	11·9	—54	121	S.S.E.

A Height in miles of commencement of isothermal column.
B Temperature, F°., at bottom of column.
C Greatest height of reliable record in miles.
D Temperature, F°., at greatest height.
E Distance in miles of point where balloon fell.
F Bearing of falling point from starting point.

On September 11th a deep low pressure area lay to the East of Iceland, and another over Eastern Russia, while an anticyclone stretched from South Sweden to Austria. On the 12th the Icelandic low pressure had disappeared and small but shallow depressions lay over the Bay of Biscay, and also over the North Sea, a high pressure still covered Austria. On the 13th a low pressure was found over Norway and Sweden, and a small high pressure to the West of Ireland. The Austrian high pressure had moved eastwards towards the Black Sea.

The week was remarkable for the break up of the excessively hot dry period which had prevailed throughout the summer of 1911. In England the change occurred on Tuesday evening, the 12th, with a drop of 20° F. and the temperature of the following week was nearly 20° F. less than that of the preceding. The accompanying rise of temperature in the upper strata is very plainly shown in the values of T_c over England on Wednesday the 13th, but the change had not reached the continent.

Over England H_c had also decreased by about a mile. It is the general rule that if the temperature of the lower air column falls, that of the upper air column, *i.e.*, the air above 7 miles, will rise, and the value of H_c will decrease.

THE EDINBURGH METEOROLOGICAL CONFERENCE.

We have received intimation that, owing to the International situation, the Meteorological Conference which was to have been held in Edinburgh from September 7th to 12th, will not take place, having been indefinitely postponed.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

VISIBILITY.

I WAS surprised that Mr. W. H. Dines considers the haziness of the air depends on the character of the district from which it comes. At the same place, with, for instance, easterly winds, I have on different occasions noticed extreme haziness and extreme clearness.

The other day a sudden N. wind brought hazy dullness which I have noticed before under similar conditions, but in winter imagined it might be an accumulation of London fog and smoke drifting south. But such an explanation would not meet this recent case. There was a very marked fall of temperature. Might this be the reason?

G. WESTON.

Bethersden, Kent, July 12th.

P.S.—Since writing, there has been a fall of 1·42 in of rain within an hour; which seems worthy of note.—G. W.

WITH reference to the letters from various correspondents on the question of visibility as a sign of rain, I would like to mention that this subject was dealt with by the late Hon. Ralph Abercromby and myself in our joint paper on "Popular Weather Prognostics," which was read before the Royal Meteorological Society in 1882. (Quarterly Journal Met. Soc., vol. 9, p. 27).

We there showed that in the wedge-shaped area of high barometric pressure which is frequently formed between a retreating and an advancing depression, that there is often great visibility with a cloudless sky, which occurs during the very fine weather on the east side of the wedge-shaped area. We quoted a number of weather sayings or prognostics for rain which we considered were to be explained by this condition of barometric pressure. The reason of "visibility" is uncertain; the old idea that it was due to excess of vapour is no doubt erroneous. The dry and wet bulb hygrometer always indicates a considerable amount of dryness when it is remarked.

There is another distribution of barometric pressure with which visibility as a prognostic of rain occurs, and that we called "straight isobars." Although there is little rain actually with these, the area which they cover to-day will probably be covered by a depression to-morrow—the conditions being favourable for the passage of depressions. With this type there is often great visibility with a hard overcast sky and moderately dry air, in which the stratus seems to play the part of a sunshade, for as soon as the sun comes out the

clearness of distant objects diminishes. This visibility should not be confounded with the visibility with a cloudless sky, which occurs with wedge-shaped isobars.

WM. MARRIOTT.

WIND DIRECTION AND RAINFALL.

I HAVE read with interest the notice in the July number of the *Meteorological Magazine* of the paper read by Mr. Bartlett at the meeting of the Royal Meteorological Society on "The Relation between wind direction and Rainfall." It may interest him to know that I have taken the wind direction and rainfall here for the decade 1900-1909, and the result is shown in the table below :—

Decade 1900-1909.

	North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calm.	Total.
Wind days...	29	34	21	37	18	91	33	72	30	365
Fine days	17	20	12	13	3	25	13	36	14	153
Rain days ...	12	14	9	24	15	66	20	36	16	212
Rain..... ins.	1·30	1·57	1·51	4·95	3·18	9·55	2·51	3·28	2·21	30·06

MORRIS BIRKBECK.

Kalsi, Shortheath, Farnham, Surrey, July 19th, 1914.

A WARNING AGAINST UNCERTIFIED MEASURING GLASSES.

THE figures obtained for the first part of last year having shown discrepancies with those of surrounding gauges, I was led to calibrate the measuring glass belonging to the temporary gauge which I had used for this period, by comparison with a certified measure. The glass had been supplied by a well-known stores. The comparison brought to light the following glaring errors.

Old measuring glass.	Standard measuring glass.
in.	in.
·50	·55
·41	·45
·35	·39
·26	·29
·20	·21
·16	·16
·10	·10
·04	·03
·02	·01
·01	The space occupied by this division is mostly solid glass

These figures, which were selected somewhat at random from those obtained in the comparison, should serve as a warning against using measuring glasses without certificates.

A. E. SWINTON.

Swinton House, Duns, Berwickshire.

HEAVY STORM IN THE ISLE OF THANET.

A VERY remarkable storm for the Isle of Thanet occurred on July 22nd. At about 2 p.m., observing at Garlinge, Westgate-on-Sea, I noticed a deep gloom toward the east, over Margate and Ramsgate. This gradually spread over towards my place of observation, until at 2.30 it became necessary to use artificial light. At this period there was one slight " crackle " of thunder, but no lightning was seen, and no rain fell. At 2.45, however, the storm seemed to " burst " suddenly overhead, and there were two simultaneous flashes and crashes of lightning and thunder. The rain then descended in torrents for half-an-hour, and ·72 in. was deposited in my gauge. Owing to the courtesy of the various Observers I am able to give the falls at other points in the Isle of Thanet. At Margate (Clifton-ville) the fall was as much as 2·03 in. The Observer here also reports that 1·50 in. fell in an hour, several parts of the town being flooded. It was an extraordinary downpour for the district, and Mr. C. J. Pemble, Assistant to the Borough Meteorologist, to whom I am indebted for these figures, tells me that the only approach to such a fall in fifteen years records was 1·21 in. on July 23rd, 1903.

Returning to the storm of July 22nd last, the rainfall at Broad-stairs (St. Peter's) was 1·82 in., and at Ramsgate, 1·15 in.

It is a curious thing that storms pass to the right and left of a line drawn through Garlinge, which has the lowest rainfall of the Isle of Thanet. The storms pass over Herne Bay and Birchington on one side and Margate and Ramsgate on the other, leaving Westgate and Garlinge fairly free from such visitations.

D. W. HORNER, F.R.Met.Soc.

Garlinge, Westgate-on-Sea, July 31st, 1914.

THE STORM OF JULY 1st, 1914.

THE storm commenced about 5.30 with a wind squall which raised great clouds of dust. Then rain descended in a deluge. During the first half hour the rain was very heavy and the thunder and lightning very violent and almost incessant. One terrific crash occurred at 5.45, and sounded like a battery of guns going off one after the other. The lightning struck the chimney of the Council School close to Winksworth Station, where I was waiting for the storm to abate. After 6 o'clock the violence of the storm abated, but rain continued to fall heavily, with occasional thunder and lightning until 9 o'clock. Another sharp shower with one or two flashes of lightning occurred soon after 10 p.m.

The total fall up to 9 a.m. on the 2nd was 1·09 in. Of this about ·60 in. fell in the 75 minutes ending 6.45 p.m. Another heavy storm occurred about 7 p.m. on 2nd July. THOMAS GIBBS.

Greengates, Worksworth.

RAINFALL TABLE FOR JULY, 1914.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH. Aver. 1875—1909. in.	1914. in.
		° ′	° ′			
Camden Square	*London*	51 32	0 8	111	2·57	1·26
Tenterden	*Kent*	51 4	*0 41	190	2·21	2·03
Arundel (Patching)	*Sussex*	50 51	0 27	130	2·46	1·66
Fawley (Cadland)	*Hampshire*	50 50	1 22	52	2·42	3·52
Oxford (Magdalen College)	*Oxfordshire*	51 45	1 15	186	2·43	3·11
Wellingborough (Croyland Abbey)	*Northampton*	52 18	0 41	174	2·54	...
Shoeburyness	*Essex*	51 31	*0 48	13	1·73	2·54
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	2·68	2·50
Geldeston [Beccles]	*Norfolk*	52 27	*1 31	38	2·37	2·29
Polapit Tamar [Launceston]	*Devon*	50 40	4 22	315	2·74	4·49
Rousdon [Lyme Regis]	,,	50 41	3 0	516	2·68	6·12
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	2·75	3·64
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	2·58	4·39
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	2·60	1·72
Boston	*Lincolnshire*	52 58	0 1	11	2·35	1·22
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	2·35	2·28
Macclesfield	*Cheshire*	53 15	2 7	501	3·41	4·55
Southport (Hesketh Park)	*Lancashire*	53 39	2 59	38	2·92	4·73
Arncliffe Vicarage	*Yorkshire, W.R.*	54 8	2 6	732	4·75	3·73
Wetherby (Ribston Hall)	,, ,,	53 59	1 24	130	2·56	3·98
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	2·39	3·36
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	2·90	2·92
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	8·91	6·23
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	3·26	6·50
Haverfordwest	*Pembroke*	51 48	4 58	90	3·39	5·44
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	4·03	5·60
Llandudno	*Carnarvon*	53 20	3 50	72	2·52	3·49
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	3·20	2·81
Marchmont House	*Berwick*	55 44	2 24	498	3·30	1·47
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	3·73	2·90
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	2·91	2·46
Inveraray (Newtown)	*Argyll*	56 14	5 4	17	4·72	2·27
Mull (Quinish)	,,	56 34	6 13	35	4·12	3·12
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	2·84	2·15
Braemar	*Aberdeen*	57 0	3 24	1114	2·65	2·12
Aberdeen (Cranford)	,,	57 8	2 7	120	3·00	4·01
Cawdor	*Nairn*	57 31	3 57	250	3·14	3·27
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	2·98	1·42
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	5·35	5·76
Dunrobin Castle	*Sutherland*	57 59	3 56	14	2·91	3·53
Wick	*Caithness*	58 26	3 6	77	2·67	3·62
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	3·53	4·10
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	3·13	3·70
Nenagh (Castle Lough)	*Tipperary*	52 54	8 24	120	3·02	2·18
Ennistymon House	*Clare*	52 57	9 18	37	3·57	3·56
Gorey (Courtown House)	*Wexford*	52 40	6 13	80	2·90	3·01
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	2·99	3·33
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	2·60	2·23
Mullingar (Belvedere)	*Westmeath*	53 29	7 22	367	3·16	2·65
Crossmolina (Enniscoe)	*Mayo*	54 4	9 16	74	3·26	4·32
Cong (The Glebe)	,,	53 33	9 16	112	3·72	4·27
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	3·36	4·18
Seaforde	*Down*	54 19	5 50	180	3·32	2·47
Bushmills (Dundarave)	*Antrim*	55 12	6 30	162	3·28	1·43
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	3·34	2·53

RAINFALL TABLE FOR JULY, 1914—*continued.*

RAINFALL OF MONTH (*con.*)					RAINFALL FROM JAN. 1.					
Diff. from Av. in.	% of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days	Aver. 1875–1909. in.	1914. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1875–1909. in.	STATION.
—1·31	49	·34	5	15	13·53	12·39	—1·14	92	25·11	Camden Square
— ·18	92	·45	15	15	13·65	15·11	+1·46	111	27·64	Tenterden
— ·80	67	·50	12	13	14·92	15·79	+ ·91	106	30·48	Patching
+1·10	146	1·26	19	20	15·73	17·52	+1·79	111	31·87	Cadland
+ ·68	128	·64	2	18	13·03	13·66	+ ·63	105	24·58	Oxford
...	...	...	...	...	13·68	...	..	...	25·17	Croyland Abbey
+ ·81	147	1·77	15	12	9·73	10·52	+ ·79	108	19·28	Shoeburyness
— ·18	93	·96	3	10	13·44	13·82	+ ·38	103	25·40	Westley
— ·08	97	·94	15	14	11·98	12·12	+ ·14	101	23·73	Geldeston
+1·75	164	·93	19	20	18·62½	25·04	+6·42	135	38·27	Polapit Tamar
+3·44	228	3·20	19	16	17·01	21·49	+4·48	126	33·54	Rousdon
+ ·89	132	·52	2	23	15·83	16·81	+ ·98	106	29·81	Stroud
+1·81	170	1·74	2	17	16·88	16·61	— ·27	98	32·41	Wolstaston
— ·88	66	·50	6	11	15·35	11·52	—3·83	75	28·98	Coventry
—1·13	52	·20	1	18	12·21	10·59	—1·62	87	23·35	Boston
— ·07	97	·75	1	15	13·15	10·36	—2·79	79	24·46	Hodsock Priory
+1·14	133	1·20	16	23	18·17	19·88	+1·71	109	34·73	Macclesfield
+1·81	162	1·19	16	19	15·88	15·73	— ·15	99	32·70	Southport
—1·02	79	1·15	16	17	31·97	31·91	— ·06	100	61·49	Arncliffe
+1·42	156	2·10	1	9	14·19	13·17	—1·02	93	26·87	Ribston Hall
+ ·97	141	1·35	2	18	13·47	11·70	—1·77	87	26·42	Hull
+ ·02	101	1·23	16	14	14·45	14·33	— ·12	99	27·94	Newcastle
—2·68	70	1·38	31	19	65·29	70·11	+4·82	107	129·48	Seathwaite
+3·24	199	1·70	19	26	20·48	27·18	+6·70	133	42·28	Cardiff
+2·05	160	1·11	4	17	22·84	23·36	+ ·52	102	46·81	Haverfordwest
+1·57	139	1·16	1	21	22·15	26·36	+4·19	119	45·46	Gogerddan
+ ·97	139	1·12	1	16	14·89	15·73	+ ·84	106	30·36	Llandudno
— ·39	88	·73	30	16	22·26	24·62	+2·36	111	43·47	Cargen
—1·83	45	·54	31	8	17·68	14·08	—3·60	80	33·76	Marchmont
— ·83	78	·77	14	17	24·83	27·77	+2·94	112	49·77	Girvan
— ·45	85	1·15	1	10	18·42	18·30	— ·12	99	35·97	Glasgow
—2·45	48	·49	5	16	34·04	37·81	+3·77	111	68·67	Inveraray
—1·00	76	·54	6, 11	19	27·67	28·65	+ ·98	104	56·57	Quinish
— ·69	76	·71	31	13	14·86	13·00	—1·86	87	28·64	Dundee
— ·53	80	·65	2	14	17·80	18·99	+1·19	107	34·93	Braemar
+1·01	134	·73	15	13	17·02	15·57	—1·45	91	32·73	Aberdeen
+ ·13	104	·51	26	14	15·65	14·90	— ·75	95	29·33	Cawdor
—1·56	48	·36	6	14	23·20	20·85	—2·35	90	44·53	Fort Augustus
+ ·41	108	1·28	22	16	42·90	51·98	+9·08	121	83·93	Bendamph
+ ·62	121	1·21	6	16	17·19	17·28	+ ·09	101	31·90	Dunrobin Castle
+ ·95	136	·86	25	18	15·38	15·50	+ ·12	101	29·88	Wick
+ ·57	116	·70	4	27	28·40	34·78	+6·38	122	54·81	Killarney
+ ·57	118	·69	4	18	20·53	19·05	—1·48	93	39·57	Waterford
— ·84	72	·52	18	18	20·53	20·60	+ ·07	100	39·43	Castle Lough
— ·01	100	·95	30	26	23·24	27·22	+3·98	117	46·52	Ennistymon
+ ·11	104	·74	4	13	18·32	17·27	—1·05	94	34·99	Courtown Ho.
+ ·34	111	·47	18	19	18·83	18·91	+ ·08	100	35·92	Abbey Leix
— ·37	86	·69	4	20	14·75	11·24	—3·51	76	27·68	Dublin
— ·51	84	·40	4	17	19·17	18·42	— ·75	96	36·15	Mullingar
+1·06	132	·89	1	22	26·64	29·77	+3·13	112	52·87	Enniscoe
+ ·55	115	1·06	30	20	25·13	28·50	+3·37	113	48·90	Cong
+ ·82	124	·58	26	21	22·19	24·67	+2·48	111	42·71	Markree
— ·85	74	·75	3	15	20·74	17·61	—3·13	85	38·91	Seaforde
—1·85	44	·29	31	16	18·77	17·42	—1·35	93	37·56	Dundarave
— ·81	76	·35	4	16	20·44	21·22	+ ·78	104	39·38	Omagh

SUPPLEMENTARY RAINFALL, JULY, 1914.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road .	2·22	XI.	Lligwy	...
,,	Ramsgate	3·56	,,	Douglas	2·84
,,	Hailsham	1·87	XII.	Stoneykirk, Ardwell House...	4·22
,,	Totland Bay, Aston House...	3·44	,,	Dalry, The Old Garroch.....	3·35
,,	Stockbridge, Ashley..	2·66	,,	Beattock, Kinnelhead	3·48
,,	Grayshott	2·63	,,	Langholm, Drove Road	3·60
III.	Harrow Weald, Hill House...	1·65	XIII.	Meggat Water, Cramilt Lodge	1·90
,,	Caversham, Rectory Road ...	2·14	,,	North Berwick Reservoir.....	...
,,	Pitsford, Sedgebrook.....	2·66	,,	Edinburgh, Royal Observaty.	2·35
,,	Woburn, Milton Bryant.....	1·80	XIV.	Maybole, Knockdon Farm ...	1·91
,,	Chatteris, The Priory..... ...	1·27	XV.	Ballachulish House	...
IV.	Elsenham, Gaunts End	1·96	,,	Campbeltown, Witchburn ..	2·34
,,	Colchester, Hill Ho., Lexden	2·03	,,	Holy Loch, Ardnadam.....	3·20
,,	Ipswich, Rookwood, Copdock	1·33	,,	Islay, Eallabus	2·99
,,	Blakeney..... . ..	1·36	,,	Tiree, Cornaigmore	2·81
,,	Swaffham	1·10	XVI.	Dollar Academy	3·70
V.	Bishops Cannings	3·94	,,	Balquhidder, Stronvar.....	3·24
,,	Wimborne, St. John's Hill ...	4·05	,,	Glenlyon, Meggernie Castle..	2·43
,,	Ashburton, Druid House.. ...	4·79	,,	Blair Atholl	2·93
,,	Cullompton	4·09	,,	Coupar Angus	3·02
,,	Lynmouth, Rock House	3·91	,,	Montrose, Sunnyside Asylum.	2·50
,,	Okehampton, Oaklands.. ...	4·67	XVII.	Alford, Lynturk Manse	3·30
,,	Hartland Abbey.....	4·22	,,	Fyvie Castle	5·48
,,	Probus, Lamellyn.....	4·94	,,	Keith Station	4·89
,,	North Cadbury Rectory.....	4·80	XVIII.	Rothiemurchus	3·18
VI.	Clifton, Pembroke Road.....	5·60	,,	Loch Quoich, Loan	9·15
,,	Ross, The Graig	4·73	,,	Drumnadrochit	2·21
,,	Shifnal, Hatton Grange.....	4·70	,,	Skye, Dunvegan	3·18
,,	Droitwich.....	3·41	,,	Lochmaddy, Bayhead	2·83
,,	Blockley, Upton Wold.....	4·08	,,	Glencarron Lodge	5·62
VII.	Market Overton.....	2·35	XIX.	Invershin	3·87
,,	Market Rasen	2·35	,,	Melvich	5·22
,,	Bawtry, Hesley Hall	2·66	,,	Loch Stack, Ardchullin	7·44
,,	Derby, Midland Railway.....	3·53	XX.	Skibbereen Rectory	4·88
,,	Buxton	5·07	,,	Dunmanway, The Rectory ..	4·43
VIII.	Nantwich, Dorfold Hall	4·45	,,	Glanmire, Lota Lodge, No. 1	4·48
,,	Chatburn, Middlewood	4·22	,,	Mitchelstown Castle.....	5·41
,,	Cartmel, Flookburgh	5·52	,,	Darrynane Abbey.....	6·11
IX.	Langsett Moor, Up. Midhope	2·77	,,	Clonmel, Bruce Villa	2·35
,,	Scarborough, Scalby	5·08	,,	Newmarket-on-Fergus, Fenloe	3·46
,,	Ingleby Greenhow	5·90	XXI.	Laragh, Glendalough	2·99
,,	Mickleton	1·40	,,	Ballycumber, Moorock Lodge	2·80
X.	Bellingham, High Green Manor	2·61	,,	Balbriggan, Ardgillan	2·56
,,	Ilderton, Lilburn Cottage ...	1·69	XXII.	Woodlawn	2·70
,,	Keswick, The Bank.....	3·69	,,	Westport, St. Helens	3·79
XI.	Llanfrechfa Grange	5·58	,,	Dugort, Slievemore Hotel ...	3·50
,,	Treherbert, Tyn-y-waun	8·10	,,	Mohill Rectory	3·19
,,	Carmarthen, The Friary	6·46	XXIII.	Enniskillen, Portora.....	2·95
,,	Castle Malgwyn [Llechryd]...	3·15	,,	Dartrey [Cootehill]	2·60
,,	Crickhowell, Tal-y-maes.....	5·40	,,	Warrenpoint, Manor House ..	3·17
,,	New Radnor, Ednol	5·40	,,	Banbridge, Milltown	2·01
,,	Birmingham WW., Tyrmynydd	6·08	,,	Belfast, Cave Hill Road	2·56
,,	Lake Vyrnwy	...	,,	Glenarm Castle..... ...	...
,,	Llangyhanfal, Plâs Draw.....	5·42	,,	Londonderry, Creggan Res ..	3·31
,,	Dolgelly, Bryntirion.....	6·16	,,	Dunfanaghy, Horn Head ...	3·57
,,	Bettws-y-Coed, Tyn-y-bryn...	3·45	,,	Killybegs	5·19

METEOROLOGICAL NOTES ON JULY, 1914.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow; F for number of days Frost in Screen; f on Grass.

LONDON, CAMDEN SQUARE.—A fine or fair month, with occasional light R. Temp. fluctuated considerably, being generally higher in the first half than in the latter half. There were no sunless days, but the daily amounts of sunshine were not large, only four days having more than 10 hours duration. Mean temp. 64°·4, or 0°·9 above the average. Duration of sunshine 150·2* hours, and of R, 28·7 hours. Evaporation 2·72 in. Shade max. 93°·7 on 1st, and the highest temp. since the record high temp. of 97°·1 on August 9th, 1911; min. 47°·3 on 30th. F 0, f 0.

TENTERDEN.—Hot on 1st and from 10th to 14th. TS on 12th, and numerous things struck in the neighbourhood. Duration of sunshine 198† hours. Shade max. 86°·5 on 1st; min. 47°·0 on 31st. F 0, f 0.

TOTLAND BAY.—The wettest July since 1894. Duration of sunshine 212·0* hours, or 25·8 hours below the average. Shade max. 79°·5 on 1st; min. 48°·8 on 30th. F 0, f 0.

PITSFORD.—Mean temp. 61°·4. R ·95 in. below the average. Shade max. 85°·6 on 1st; min. 46°·3 on 29th.

IPSWICH, COPDOCK.—R much needed. Mean temp. 62°·5. Duration of sunshine 186·8* hours. Shade max. 83°·5 on 1st; min. 45°·4 on 31st. F 0, f 0.

ROUSDON.—The wettest July since observations began in 1883. Continuous R from 8 p.m. on 18th to 2 a.m. on 20th, the total being 3·70 in., of which 3·20 in. fell on 19th, the heaviest daily fall in 31 years.

NORTH CADBURY.—Much the wettest July in at least 20 years. Shade max. 90° on 1st; min. 43° on 4th. F 0, f 0.

HODSOCK PRIORY.—Shade max. 84°·2 on 21st; min. 44°·7 on 31st. F 0, f 0.

SOUTHPORT.—The wettest July, except 1909, for 25 years. Damaging TSS on 1st and 2nd. Duration of sunshine 172·5* hours, or 39·8 hours below average. Duration of R 69·8 hours. Mean temp. 60°·4, or 1°·0 above average. Shade max. 80° on 10th; min. 47° on 4th. F 0, f 0.

HULL.—TSS on 1st and 2nd, with R measuring 2·12 in., then finer to 12th; afterwards cloudy generally, with R on most days. Duration of sunshine 98·3* hours. Shade max. 78° on 21st; min. 48° on 23rd. F 0, f 0.

HAVERFORDWEST.—Fine and warm, with considerable R but no TSS. Duration of sunshine 202·9* hours. Shade max. 76°·2 on 1st; min. 47°·8 on 6th.

LLANDUDNO.—Shade max. 79° on 11th; min. 50° on 29th.

CARGEN.—Comparatively high temp., culminating in the shade max. of 83°·5 on 21st, prevailed for the first 3 weeks, followed by a sudden fall, 20° being difference between max. on 21st and 23rd. Shade min. 37°·0 on 4th.

ARDNADAM.—Pleasant, dry month, except 23rd to 27th which were almost wintry. Shade max, 75°·6 on 21st; min. 38°·1 on 4th. F 0, f 0.

ABERDEEN.—Wet, with little sunshine and frequent fog. N.N.W. gale on 24th to 26th.

LOCH STACK.—Duration of sunshine 151·8* hours.

ENNISTYMON.—A month of many showers which, owing to high winds, did not benefit the parched land much, but impeded hay-making.

DUBLIN.—A changeable but withal favourable month. There was again a marked prevalence of N.W. winds and clouds. Mean temp. 59°·6. Shade max. 73°·8 on 21st; min. 48°·3 on 3rd. F 0, f 0.

MARKREE.—Stormy and wet, with low temp. for the time of year, though the nights were mild.

KILLIBEGS.—A fine month on the whole. Fairly sunny with some hot days.

* Campbell-Stokes. † Jordan.

Climatological Table for the British Empire, February, 1914.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	59·1	14	29·4	27	51·1	38·5	40·7	88	91·9	27·3	2·37	14	6·8
Malta	65·7	21	47·0	24	59·5	51·2	...	85	121·0	..	1·71	6	1·1
Lagos	90·4	22	72·0	14	89·1	77·0	74·6	75	151·0	69·0	1·17	5	5·0
Cape Town	94·3	7	48·1	13	79·6	60·9	57·7	65	...	...	·33	4	2·2
Natal, Durban ...	81·0	8, 14	66·0	15	76·3	69·5	68·8	80	...	...	9·11	18	7·0
Johannesburg	87·4	3	48·2	27	77·7	56·3	54·8	76	157·0	46·0	3·09	13	6 0
Mauritius	89·0	6	67·1	3	86·4	73·9	73·5	82	...	69·8	8·57	19	5·7
Bloemfontein	95·4	2	55·4	27	85·8	60·9	56·7	60	...	...	1·58	10	1·6
Calcutta...	91·8	14	53·6	7	84·6	64·7	62·6	68	...	47·5	1·04	2	2·7
Bombay...	86·2	20	62·1	19	83·0	69·5	64·5	68	135·0	53·7	·08	1	1·4
Madras	89·3	6	63·2	25	86·5	68·6	67·4	74	154·2	59·1	·00	0	1·6
Colombo, Ceylon ...	93·1	10	66·6	6	88·2	71·4	70·4	75	159·8	59·0	1·56	3	3·4
Hongkong	78·3	19	48·7	11	66·9	59·9	57·0	79	...	...	3·24	8	7·7
Sydney	94·9	9	60·3	13	78·0	66·5	60·0	67	147·7	51·7	1·69	16	6·1
Melbourne	106·0	17	49·0	13	82·6	59·3	53·0	52	160·8	42·7	·15	4	3·0
Adelaide	111·9	18	48·8	11	90·4	63·4	53·1	41	165·3	39·5	·34	2	2·7
Perth	103·0	24	48·9	18	81·8	61·8	55·8	57	167·0	46·1	·83	5	3·3
Coolgardie	106·4	16	51·0	19	91·0	61·7	51·1	38	171·8	46·8	·45	3	2·8
Hobart, Tasmania ..	93·2	14	48·0	8, 14	72·0	53·7	49·5	61	142·8	41·3	·11	5	5·8
Wellington	79·0	17	45·4	27	69·7	56·9	55·0	75	140·4	37·0	1·93	11	6·4
Auckland	77·0	20	50·0	27	72·3	60·3	58·6	76	150·0	44·0	1·66	9	5·7
Jamaica, Kingston ..	91·4	9	61·7	23	87·2	68·5	63·9	66	...	...	·28	2	...
Grenada	87·0	26, 27	69·0	10	82·9	72·1	...	73	137·0	...	2·09	12	3·0
Toronto	44·7	3	-18·2	12	23·3	7·7	9·1	82	79·6	-20·2	1·87	12	4·1
Fredericton	47·5	28	-24·0	22	21·1	-3·9	...	78	...	...	1·40	8	3·8
St. John, N.B. ...	43·9	7	-19·7	12	23·9	6·1	5·0	69	...	...	2·10	8	3·9
Edmonton, Alberta ...	50·2	15	-34·6	5	17·9	-3·7	...	77	106·3	-40·2	·63	13	6·4
Victoria, B.C.	53·3	20	25·6	5	46·1	37·9	37·0	82	...	...	1·56	13	7·3

Johannesburg.—Bright sunshine 204·4 hours.

Mauritius.—Mean temp. of air 1°·2, dew point 2°·4, and R 1·54 in., above averages. Mean hourly velocity of wind 6·9 miles, or 4·1 below average.

COLOMBO.—Mean temp. of air 79°·9, or 0°·2 below, and R ·07 in. above, averages. Mean velocity of wind 3·7 miles per hour. TS on 14th and 15th.

HONGKONG.—Mean temp. of air 63°·1. Mean hourly velocity of wind 14·4 miles. Bright sunshine 117·6 hours.

Melbourne.—Mean temp. of air 3°·7 above, and R 1·58 in. below, averages.

Adelaide.—Mean temp. of air 2°·9 above, and R ·28 in. below, averages.

Perth.—Mean temp. of air 2°·4 below average.

Coolgardie.—Temp. of air 0°·3 above, and R ·24 in. below, averages.

Hobart.—Temp. of air 0°·6 below average.

Wellington.—Mean temp. of air 1°·0 above, and R 1·50 in. below, averages. Bright sunshine 213·7 hours.

Auckland.—R barely half the average. Mean temp. slightly below average.

ALBERTA, EDMONTON.—A cold, showery month, with great temp. variations, and heavy W. gale on 27th.